

What is Claimed Is:

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1. A low energy method of pyrolysis of hydrocarbon material comprising:

5 providing said hydrocarbon material;
 loading said hydrocarbon material into a reaction chamber;
 adding a catalyst to said reaction chamber, and
 heating said reaction chamber for a sufficient time to provide substantially complete pyrolysis,
 said method occurring while maintaining a vacuum and yielding
 10 reaction products comprising a solid carbonaceous residue, a liquid hydrocarbon product and a combustible gas.

2. The method of Claim 1, wherein said catalyst is clay.

3. The method of Claim 2, wherein said clay is selected from the group consisting of montmorillonite, bentonite, beidillite and combinations thereof.

15 4. The method of Claim 2, wherein said clay is pillared clay.

5. The method of Claim 2, wherein said clay is a natural ore.

6. The method of Claim 1, wherein said catalyst is a commercial clay containing product.

7. The method of Claim 6, wherein said commercial clay product
 20 is selected from the group consisting of cat litter and oil spill absorbent and combinations thereof.

8. The method of Claim 2, wherein said catalyst is added in an amount of about 0.01 wt.% to 3.0 wt.%, based on the total weight of said hydrocarbon material.

25 9. The method of Claim 1, wherein said heating of said reaction chamber results in a reaction temperature of said hydrocarbon material of between about 150° to 850° F.

10. The method of Claim 1, wherein said reaction temperature of said hydrocarbon material is maintained at between about 350° to 850°F.

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11. The method of Claim 1, wherein said heating occurs in at least a first, second and third phases and fuel input is adjusted to take advantage of the exothermic nature of the reaction.

5 12. The method of Claim 11, wherein said first, second and third phase occur sequentially over time.

13. The method of Claim 11, wherein said first, second and third phase occur sequentially over space, as said hydrocarbon material moves through said reaction chamber.

10 14. The method of Claim 1, wherein said vacuum is maintained at a pressure of between about 2 inches to 16 inches mercury.

15 15. The method of Claim 11, wherein said vacuum is maintained at pressure of between about 2 inches to 16 inches mercury.

16. A low energy method of pyrolysis of hydrocarbon material comprising:

15 providing said hydrocarbon material;
loading said hydrocarbon material into a reaction chamber;
heating said reaction chamber, said heating occurring in at least a first, a second and a third phase; and
adjusting input of fuel to take advantage of the exothermic nature of

20 the reaction, said method occurring while maintaining a vacuum and yielding reaction products comprising a carbonaceous solid residue, a liquid hydrocarbon product and a combustible gas.

17. The method of Claim 16, wherein said phases occur sequentially over time.

25 18. The method of Claim 16, wherein said phases occur sequentially over space, as said hydrocarbon material moves through said reaction chamber.

19. The method of Claim 16, wherein said vacuum is maintained at a pressure of between about 2 inches to 16 inches mercury.

30 20. The method of Claim 1, wherein said hydrocarbon material is used rubber.

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26. A process for reclamation and recovery of constituents of discarded vehicle tires and other rubber products cut into pieces for reuse or environmentally safe disposal, comprising:

transferring tire pieces from a feed supply by a conveyor into a feeder
5 bin; and

transferring the tire pieces from the feeder bin to the inlet of a low temperature reactor chamber by a helicoid auger.

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